

***Azure Dynamics – Transit Connect
EV2011VE***

***A Retrospective on the Transit
Connect Battery Electric Vehicle
Design***

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Overview

1. What is the TCBEV

1.1. Where is it Designed

1.2. Where is it Built

2. Perspectives

2.1. West Coast Perspective

2.2. Canadian Perspective

2.3. Avoiding Sales Agents

2.4. Not watching your "Neighbour"

3. Closing

Who am I?

Previously:

- Electrical Team: schematics, harnesses and routing

Currently:

- Systems Team: component sizing and systems interconnection

Driving a world of difference

AZD

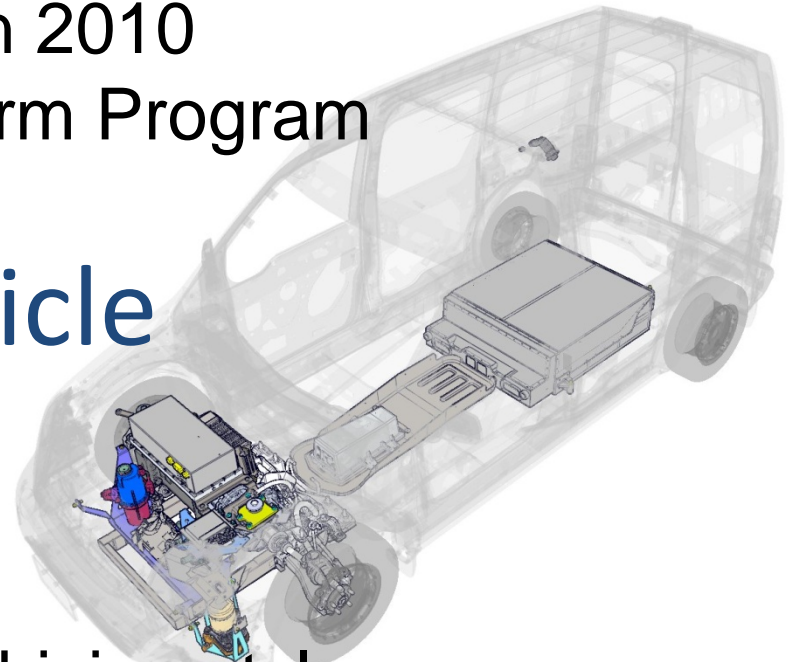
1. What is the TCBEV

Transit Connect Battery Electric Vehicle

- > Delivery vehicle
- > Brought to North America in 2010
- > Part of Ford's Global Platform Program
 - > Initially released in Europe

Battery Electric Vehicle

- > 28 kWh Lithium Ion Pack
- > 300 Nm Induction Motor
- > Over 120 km range
 - Depending on loads and driving style
- > Sold in Europe and North America



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1.1 Where is it Designed

Vancouver: Concept to Prototype
Controls, Electrical, Mechanical

Mississauga: Program Management
Close to Ford (partnership)

Boston: Traction System Components
Motor, DMoC, Gearbox modification

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1.2 Where is it Built

Holland – Build Facility
AM General resident team

Worcester - Build Facility
LLS resident Team

Detroit
Manages Production and Year to Year updates

Stevenage
Support European Deployment

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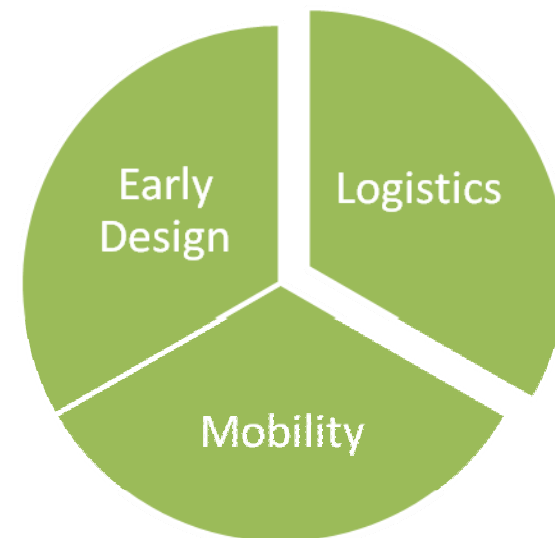
2.1 West Coast Perspective

> Multicultural Office

- > Multiple languages facilitates communication with designers in native language
- > Familiar with working in different cultures
- > Ease of travel to restrictive countries on short notice

> Fresh perspective

- > Not all of the engineers are Automotive industry trained, leads to fresh perspectives; experienced management



2.1 West Coast Perspective

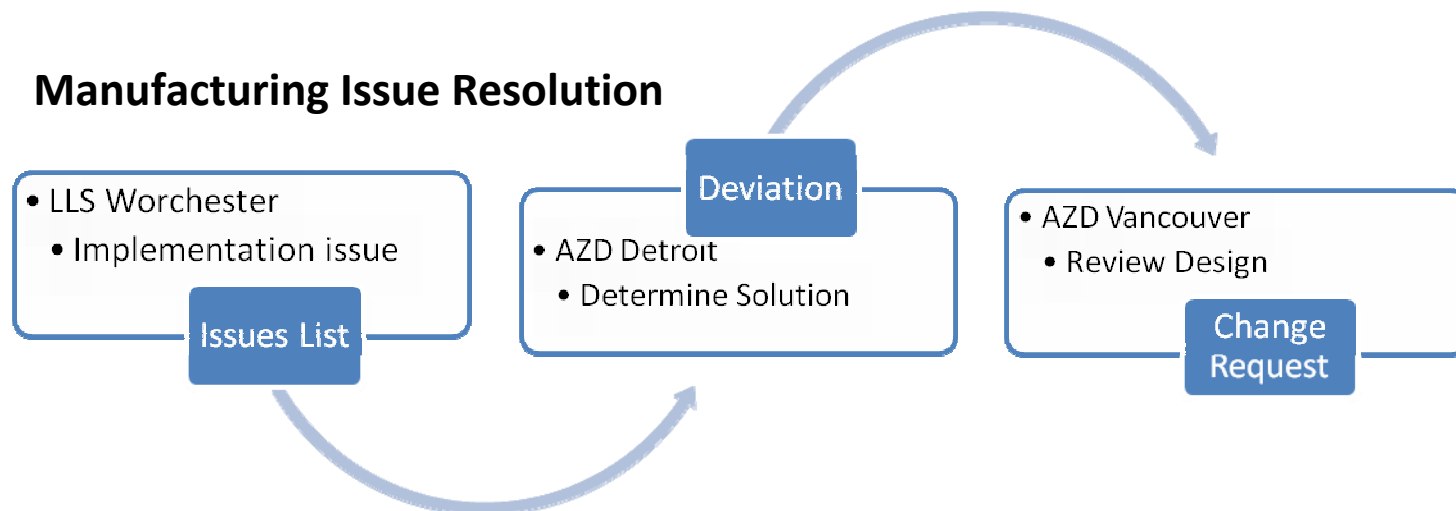
> Work occurring around the clock:

- + 8 hours to Tokyo
- 8 hours to London
- 3 hours to Toronto

> Company Structure:

- > Design flow allows for all office locations to address issues
- > Synonymous with Cloud computing

Manufacturing Issue Resolution



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2.2 Canadian Perspective

- > International Suppliers
 - > Yazaki in Japan, US, Mexico
 - > Beuler in Germany
 - > Hellermann Tyton with US, UK and German manufacturing

- > International Benefits
 - > Metric Designs
 - > Meet EU End of Life Directives (EU ELV), RoHS, etc.
 - > Meet material marking requirements for recyclability

Ford Transit Connect Gasoline

Vehicle

Design

• Europe

Manuf.

• Turkey

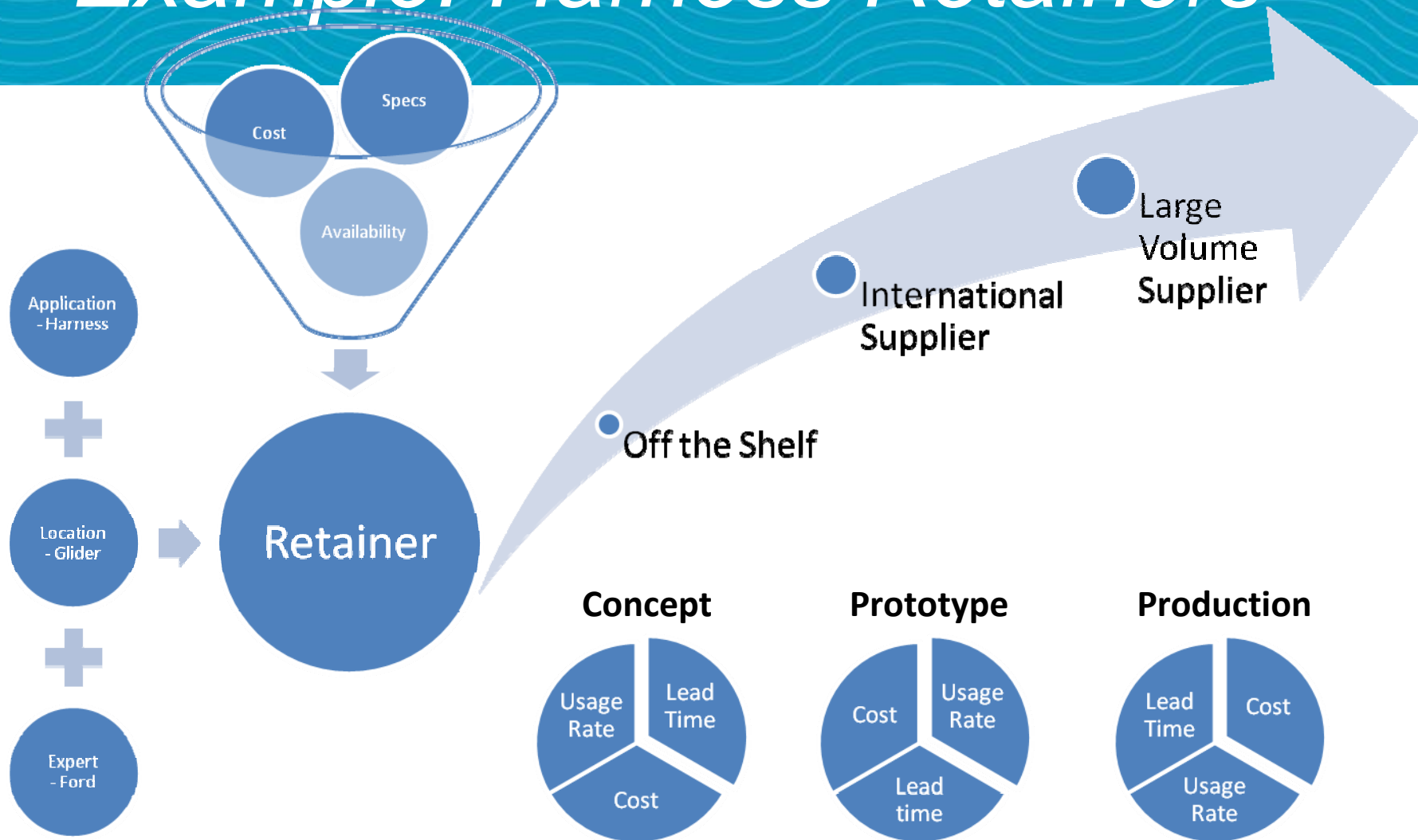
Sale

• US

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Example: Harness Retainers



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2.3 Avoiding Sales Agents

- > Most automotive suppliers are located in the East
 - > Not likely to come out West promoting prototypes
 - > Majority of correspondence in writing increases accountability
 - > International Suppliers require the same amount of interaction
- > Engineers (in general) suffer from putting “Design Solution” before “Functional Specification”
 - > i.e. Solution in search of a problem

2.4 *Not watching your “Neighbours”*

- > Innovative designs not trying to emulate any one company
- > Freedom to innovate without public criticism

3. Closing

Thank-you



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